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THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

July 25, 2024
10:23:00 AM

Academic Org: Div of Computer Science & Engg – Subject: Computer Engineering

Course: CENG5030   **Course ID:** 010567   **Eff Date:** 2024-07-01   **Crse Status: Active**   **Apprv. Status:** Approved   **[New Course]**

Energy Efficient Computing 節能計算

Low power consumption is an important design concern in modern computing systems. It has direct impact on the battery life of mobile electronic equipment and on the operating speed of computing devices. This course aims at introducing students the basic concepts and modern techniques in designing, modeling and evaluating energy-efficient computing systems. This course will study techniques to improve energy consumption at various design levels. It will also study representative research papers to introduce the state of the art approaches to energy efficient computing.
Advisory: Students are expected to have taken ENGG2020 or ESTR2104 or CENG3420.

低功耗設計是現代計算系統設計中的一個重要問題。低功耗設計對於移動電子設備的電池壽命以及計算設備的處理速度都有著直接的影響。本科旨在向學生介紹在設計、建模以及評估節能計算系統的基本概念和最新技術。本科將會從不同的設計層面來研考有關降低功耗的技術。本科將會通過選取有代表性的研究論文來介紹最優秀的節能計算方法。
建議：學生應曾修讀ENGG2020或ESTR2104或CENG3420。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

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C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:
Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis: Graded
Repeat for Credit: N
Multiple Enroll: N
Course Attributes: MSc Computer Science
MPhil-PhD Computer Sci & Erg

Topics:

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COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. understand the concepts and techniques in designing, modeling and evaluating energy-efficient computing systems.
2. master the techniques to improve energy consumption at various design levels.
3. know how to critically review literature in this field.

Course Syllabus:

Low power consumption is an important design concern in modern computing systems. It has direct impact on the battery life of mobile electronic equipment and on the operating speed of computing devices. This course aims at introducing students the basic concepts and modern techniques in designing, modeling and evaluating energy-efficient computing systems. This course will study techniques to improve energy consumption at various design levels. It will also study representative research papers to introduce the state of the art approaches to energy efficient computing.

Assessment Type:

Essay test or exam	: 50%
Others	: 40%
Short answer test or exam	: 10%

Feedback for Evaluation:

1. Course evaluation
2. Discussions with students on or off lectures

Required Readings:

To be provided by course teacher.

Recommended Readings:

1. Computer Architecture Techniques for Power-Efficiency, S. Kaxiras, M. Martonosi.
2. Power Aware Design Methodologies, M. Pedram, J.M. Rabaey.
3. Power Aware Computing, R. Melhem, R. Graybill.
4. Low Power Electronics Design, C. Piguet.

OFFERINGS

1. CENG5030   Acad Organization=CSEGV; Acad Career=RPG

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COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
SEM : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CENG5030   **Enrollment Requirement Group:**
                     For students in MSc Computer Science; or
                     For students in MPhil-PhD Computer Science & Engineering; or
                     For students in UG Computer Science; or
                     For students in UG Computer Engineering

Additional Information

VTL-Onsite face-to-face hrs   0
VTL-Online synch. hrs   0
VTL-Online asynch. hrs   0

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